ON THE BUTTERFLIES (LEPIDOPTERA: RHOPALOCERA) OF SOME TYRRHENIAN ISLANDS (SOUTHERN ITALY)

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The aim of the present paper is to summarize the results of the research carried out by the authors in some Tyrrhenian islands on and off since 1976; also included are some records made by some of our colleagues and brought to our attention. The paper is not intended to provide a comprehensive survey of the butterflies of these islands: much more work would be needed to satisfy such an aim.

The following islands and island groups were the subject of our investigation:

Eolie Islands (Aeolian Islands, Lipari Islands, Isole Eolie) were visited by G. Leigheb in July 1976, 1977, 1980 and in September 1987 as well as by O. Kudrna in June 1987.

Ischia and Vivara were visited by O. Kudrna in early June 1985.

Ponza Islands were visited by O. Kudrna in late June 1986.

The location of the islands and areas we have investigated is shown in Fig. 1.

In addition to this we have received some information on and/or specimens from Isola Panarea (Eolie Islands) from C. Prola, Isola Ischia, from D. Müting and P. Provera, and from Ponza Islands from V. Sbordoni.

The Eolie Islands are situated in the south-east of the Tyrrhenian Sea just north of north-eastern Sicily. They are of volcanic origin and some of their volcanoes are still active. The group consists of seven major islands. The chief island is Lipari; Vulcano and Salina are separated from Lipari only by some 10 km of sea; Panarea, Stromboli, Filicudi and Alicudi lie further away and are not so easy to reach on a one-day trip. All the islands are inhabited, Lipari is almost overpopulated. The most characteristic species of this archipelago is without any doubt the endemic *Hipparchia leighebi*; the apparent absence of *Gonepteryx cleopatra* is most unexpected.

The Island of Ischia is situated in the Bay of Naples; it is a well known resort, popular with tourists and holidaymakers, rather overpopulated in coastal districts. It is dominated by the highest mountain, Monte Epomeo (787 m) which is of volcanic origin and now mostly wooded. Suitable butterfly habitats can be found on the eastern, southern and western slopes of M. Epomeo and its surroundings; the northern slopes are covered by thick woods mixed with degraded garrigue, by and large inaccessible and unsuitable to butterflies. The most interesting Ischian butterfly is certainly *Hipparchia ballettoi*; *Maniola jurtina* and *Glaucopsyche alexis* were the most common species at the time of recording, apart from apparently migrating *Vanessa cardui*.

The Island of Vivara is really just a part of Procida Island, to which it is connected by a narrow isthmus carrying a bridge. Whereas Procida is heavily populated, practically just a single town, unsuitable for butterflies, Vivara is by and large covered by thick garrigue and original maquis; it is an important nature reserve. It is inhabited only by the relatively few butterfly species which can live in this specialized habitat. *Lampides boeticus* was perhaps the most common species at the time of recording.

Ponza Islands are also largely of volcanic origin; the chief island is Ponza, dominated by Monte Guardia (280 m) and flanked by the smaller islands of Zannone and Palmarola situated some 10 km north-east and west respectively. The islands of Ventotene and the tiny S. Stefano are situated nearly 50 km south-east of Ponza, about in the middle of the line from Ponza to Ischia. Only the main island Ponza was visited by us; the dominating butterfly habitat is degraded garrigue. The character-

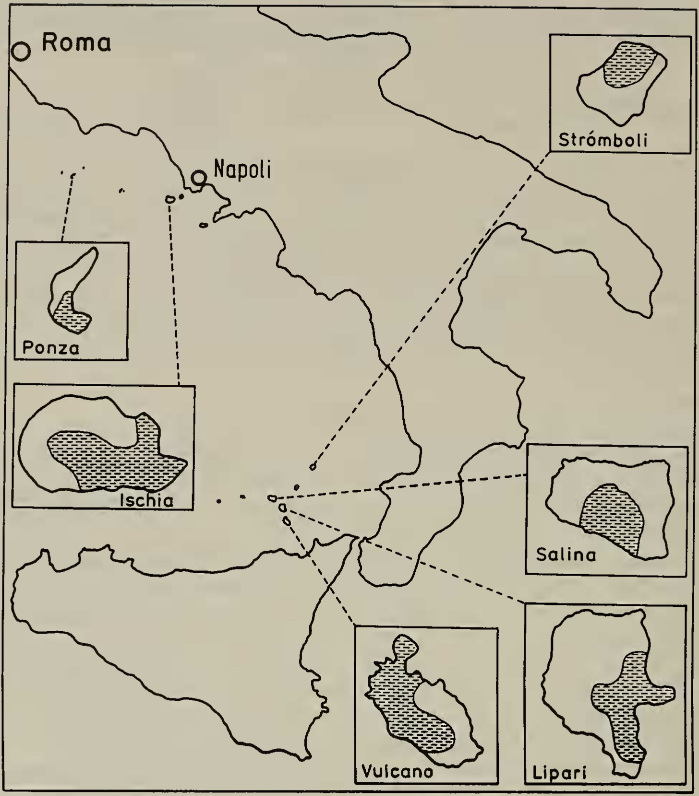

Fig. 1. Tyrrhenian islands surveyed by the authors, with areas investigated marked.

istic species of the island are the endemic *Hipparchia sbordonii* and a distinct local form of *Lasiommata megera*; very surprising was the absence of *Maniola jurtina*, which must have been on the wing at the time of the visit in other parts of Italy.

The species recorded and their distribution are shown in the Table 1.

Pieris daplidice was only observed in flight in the islands of Ischia and Ponza, *Polygonia egea* and *Argynnis pandora* have never been captured in Ischia; although their identification is to be regarded as positive, all these records require confirmation.

Hipparchia ballettoi is known from Monte Faito, south of Naples, which is its type locality, and in Isola Ischia only. Only a single male was seen (and captured) near Fontana on south-eastern slopes of M. Epomeo in early June 1985. D. Müting (pers. comm.) found males abundant, but no females, north of San Angelo on the southern coast of Ischia, i.e. further south of M. Epomeo, P. Provera found the species in late July and August on western slopes of M. Epomeo (towards Forio), flying partly together with *Hipparchia statilinus*.

Hipparchia leighebi belongs to the most widespread species in the Eolie Islands, we suspect that it will also be found in Filicudi and Alicudi (we have never been able to visit these islands, nor Panarea, owing to adverse weather encountered in June

Table 1. Species recorded.

	Islands							
Species:	Vul	Lip	Sal	Pan	Str	Pon	Isc	Viv
Papilio machaon Linnaeus, 1758	■	■	■			■		
Iphiclides podalirius Linnaeus, 1758							■	
Pieris brassicae Linnaeus, 1758	■		■			■	■	
Pieris napi Linnaeus, 1758	■	■	■		■	■	■	■
Pieris manni Mayer, 1851	■	■	■		■	■	■	
Pieris rapae Linnaeus, 1758							■	
Pieris daplidice Linnaeus, 1758	■	■				■	■	
Colias crocea Geoffroy, 1785	■	■	■			■	■	■
Gonepteryx cleopatra Linnaeus, 1767						■	■	■
Callophrys rubi Linnaeus, 1758							■	
Lycaena phlaeas Linnaeus, 1761	■	■	■				■	
Lampides boeticus Linnaeus, 1767			■			■		■
Syntarucus pirithous Linnaeus, 1767		■			■			
Celastrina argiolus Linnaeus, 1758	■	■	■					
Glaucopsyche alexis Poda, 1761							■	
Aricia agestis Den. & Schiffermüller, 1775	■	■	■					
Polyommatus icarus Rottemburg, 1775	■		■			■		
Charaxes jasius Linnaeus, 1767			■					
Polygonia egea Cramer, 1775		■					■	
Vanessa atalanta Linnaeus, 1758		■	■				■	
Vanessa cardui Linnaeus, 1758			■			■	■	■
Argynnis pandora Den. & Schiffermüller, 1775							■	
Hipparchia ballettoi Kudrna, 1984							■	
Hipparchia leighebi Kudrna, 1976	■	■	■	■	■			
Hipparchia sbordonii Kudrna, 1984						■		
Hipparchia statilinus Hufbagel, 1766							■	
Maniola jurtina Linnaeus, 1758	■	■					■	
Pyronia cecilia Vallantin, 1894	■	■	■					
Lasiommata megera Linnaeus, 1767	■	■	■		■	■	■	
Pararge aegeria Linnaeus, 1758	■	■			■	■	■	■
Gegenes pumilio Hoffmannsegg, 1804		■						

Names of islands are abbreviated as follows: Vul = Vulcano, Lip = Lipari, Sal = Salina, Pa = Panarea, Str = Stromboli, Pon = Ponza, Isc = Ischia, Viv = Vivara. The nomenclature follows Kudrna (1986).

1987). It is the only butterfly known to us from the Island of Panarea (C. Prola leg., material deposited in part in coll. R. Verity in Museo Zoologico de la Specola in Florence). *H. leighebi* is particularly abundant on the Islands of Stromboli, Vulcano and Salina. Whereas the males frequent open spaces on the slopes of Gran Cratere of Vulcano (Fig. 2), the females concentrate exclusively in relatively thick woodland consisting predominantly of olive and oleander trees (Fig. 3), practically avoiding the males; they are very rarely seen to visit flowers, settling mostly on tree trunks. Males settle both on open ground and on flowers, with an apparent preference for thistles. Both attempts to breed the species failed as the first instar larvae died shortly after they hatched.

Hipparchia sbordonii is one of the commonest butterfly species on the Island of Ponza; individuals, especially males, are often seen flying through the streets of the port of Ponza, occasionally visiting flowers of potted plants. V. Sbordoni (Kudrna, 1984) found *H. sbordonii* also on the islands of Palmarola, Zannone, Ventotene and S. Stefano. Like *H. leighebi, H. sbordonii* also shows the same odd behaviour of

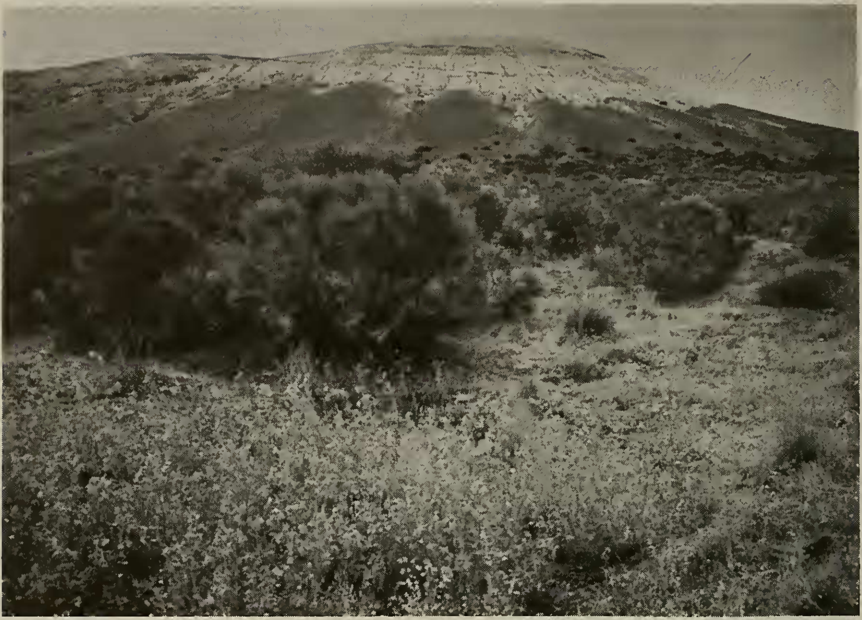

Fig. 2. Vulcano: a typical biotope of *Hipparchia leighebi* males on the slopes of the Gran Cratere.

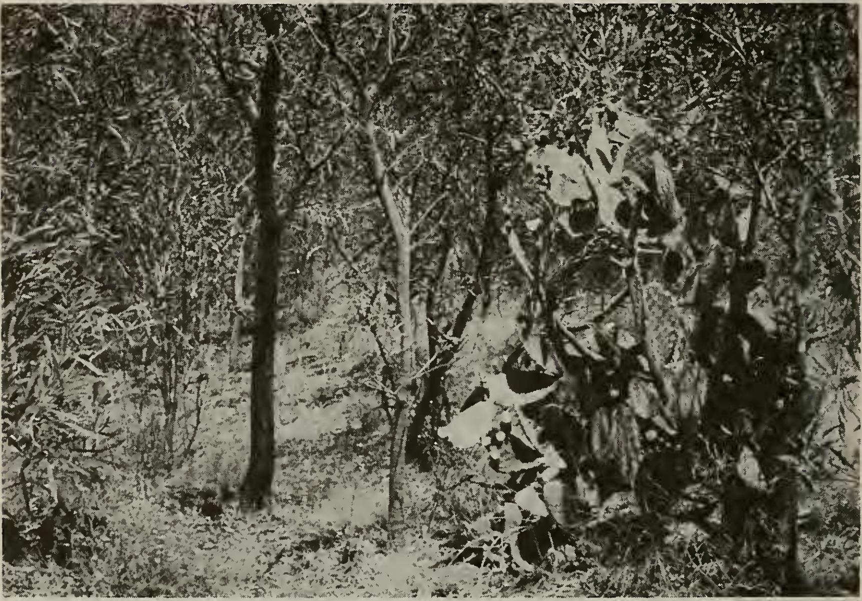

Fig. 3. Vulcano: a typical biotope of *Hipparchia leighebi* females.

territorial separation between males and females. Like *H. leighebi*, males of *H. sbordonii*, inhabit open country whereas the females concentrate in thick *Rubus* bushes, flying virtually 'inside' them, but the separation of sexes in this species does not appear to be as strict as in *H. leighebi*. It is possible that in both *H. leighebi* and *H. sbordonii* pairing takes place in late summer or in autumn: it may be an advantage in a dry and hot climate. Nevertheless, G. Leigheb obtained eggs from five females of *H. leighebi* in July 1980.

Lasiommata megera from Ponza Islands somewhat resembles *L. tigelius* Bonelli, 1826, a species endemic to Sardinia and Corsica. The examination of the male genitalia revealed that there is no very close connection between *L. megera* from Ponza and *L. tigelius*. The exact status of *L. megera* from Ponza remains an open question.

All three *Hipparchia* species, *H. ballettoi*, *H. leighebi* and *H. sbordonii* are endemic, each confined to a very restricted range. Their long-term survival depends on the conservation of their respective habitats. At present they are (probably all three) abundant and in spite of growing tourism probably not directly threatened because their habitat is of little value to humans. It would not be a bad idea to encourage the Italian government to purchase land on some of the islands and to establish there larger reserves as a preventive conservation measure.

Vannessa cardui appeared in masses on the south-eastern slopes of Monte Epomeo above Fontana (Ischia) 5.vi.1985 and disappeared completely on the following morning. It was certainly the beginning of a migration.

We hope that our preliminary treatment of the butterflies of the relatively poorly known Eolie and Ponza Islands as well as of Ischia will encourage further research into their fauna, especially of the biology of all three *Hipparchia* species, the early stages of which remain undescribed.

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